

| Date | Time | Class/Set | Lesson No | No. in class | Room |
|--|-------|--------------------|-----------|--------------|------|
| 12/11/18 | 13:10 | 7a/Sc3 | 6 | | S222 |
| Your targets from the weekly training meeting relevant to this lesson | | | | | |
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| Background of the class context of your teaching and learning plan and your expectations | | | | | |
| Targeted Support: . | | Additional Adults: | | | |
| Relevant Curriculum Statements | | | | | |
| A number of forces acting on an object may be replaced by a single force that has the same effect as all the original forces acting together. This single force is called the resultant force. Students should be able to calculate the resultant of two forces that act in a straight line. | | | | | |
| Pre-supposed knowledge (From earlier in the topic and from the previous year where this was taught)> | | | | | |
| Students can use force arrows in diagrams and add forces in one dimension. Students can identify pairs of forces that are balanced or unbalanced. | | | | | |
| Potential misconceptions | | | | | |
| Students may believe that objects at rest, even momentarily, have no net force acting on them and when moving the force is in the direction of the motion. | | | | | |
| Lesson Objectives | | | | | |
| Students should be able to: (i) Identify forces between interacting objects. (ii) Identify the free body (force) diagram representing the forces on an object. (iii) Draw and interpret free body (force) diagrams to describe the resultant force on an object. (iv) Use scale diagrams of force vectors in two dimensions to find the resultant force acting on an object. (v) Determine the change of motion caused by two dimensional forces acting on an object. | | | | | |
| Success criteria. (What will the pupils be able to do at the end of the lesson, if they meet the lesson objectives)? | | | | | |
| Students will be able to use scale diagrams of vectors, that represent forces, to find the resultant force on an object and to predict its acceleration. | | | | | |

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| Time | Teacher Activity What are you doing? Additional adults in room? | Pupil Activity What are the pupils doing? Evidence of progress? Refer to Learning Points | What specific questions are you asking/and to whom? |
|-------------|---|---|---|
| 2:00 - 2:05 | Show the students a series of images or short video clips of everyday objects in motion or at rest (e.g., a car being pushed, a tug of war, a ball being kicked, etc.). Ask students to identify the forces acting on the object in each scenario (e.g., a push, pull, friction, gravity). Teacher checks students' responses and clear misconceptions. | Students identify the forces acting on the object in each scenario and predict the direction and magnitude of the resultant force. Students share their answers with their partner and then with the class. Students do the Flying high activity. | Identify forces between interacting objects. |
| 2:05 - 2:15 | Ask students to do the Rocket activity. Use practical demonstrations with force meters or spring balances to show how forces combine. For example, show how pulling a toy car with forces from different directions affects the motion. Teacher moves from one group to another checking and guiding students. | Students write their answer to the Rocket activity on their mini whiteboard and show. Students then work in small groups using force meters or spring balances to measure forces acting on objects. They will measure forces in different directions acting on a toy car or block and calculate the resultant force. Each group presents their findings, explaining how they determined the resultant force and what it means for the object's motion. | How do forces combine |
| 2:15 - 2:25 | Ask the students to do the Cycling activity and then engage them in a whole class discussion to discuss their answers. | Students work in small groups to do the Cycling activity. | Draw and interpret free body (force) diagrams to describe the resultant force on an object. |
| 2:25 - 2:35 | Play a video to explain how to use scale diagrams of force vectors in two dimensions to find the resultant force acting on an object. Teacher then ask the students to complete a worksheet. Teacher checks students' responses and clear misconceptions. | After watching the video, students then find the resultant force acting on objects in the worksheet. Sledging fun activity. | What is resultant force acting on an object |
| 2:35 - 2:45 | Provide students with graph paper and guide them to do the Scale drawing activity. Teacher use feedback from each group and careful questioning, to bring out a clear description or explanation of the science. | Students work in pairs to complete the Scale drawing activity. | What the change of motion is caused by two dimensional forces acting on an object |
| 2:45 - 2:50 | Teacher summarize the lesson, ask questions to check students' understanding and clear any misconceptions. | Students answer and ask questions from the teacher. | |

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| Evidence of Pupil Progress (Complete this section in advance of the lesson). Students can identify the free body (force) diagram representing the forces on an object. Students can draw and interpret free body (force) diagrams to describe the resultant force on an object. Students can use scale diagrams of force vectors in two dimensions to find the resultant force acting on an object. Students can determine the change of motion caused by two dimensional forces acting on an object. | | | |

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| Resources needed: Force meter/Spring balance, toy car, |
| Health and Safety issues and Risk Assessment: |
| Homework set: Worksheet |

The next page of the lesson plan is to be completed after the lesson is finished.

Evaluation & Reflection

Please complete a detailed evaluation for each of your formally observed lessons. For other lessons, the evaluation might cover all headings below or focus on just some in detail.

Learning Outcomes/Objectives

Were Intended Learning Outcomes/Objectives met? How do you? If not, why not?

Assessment:

Were your assessment strategies effective? Did you give appropriate feedback?

Misconceptions

What misconceptions arose in this lesson, how did you tackle these? How confident are you that all pupils have a concrete understanding of the topic. Refer to evidence from the lesson.

Communication:

Were your instructions clear?

Timings/resources

Were your planned timings appropriate, did you do a plenary? If not, why not?

Inclusion

Were all pupils able to participate at an appropriate level? If not, why not?

Classroom management

Were pupils on task? If not, what might encourage them to engage in the lesson?

Conclusion

Identify pupils you need to target & why.

Was there progress against your development targets?

Identify SMART targets, referenced against CCF / Teachers' Standards

How will this inform your next lesson / future practice?